

Green Horse Project

Botany Specialist Report

Biological Assessment/Biological Evaluation

Nez Perce - Clearwater National Forest
Moose Creek Ranger District

February 2020

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Rare Plant Report

Green Horse February 2020

INTRODUCTION

Past management and fire exclusion have resulted in a forest that is composed of seral species forming dense fuels. These forests support increased insect activity and disease which further contributes to fuel loading and increased fire susceptibility. Among other things, this project will implement vegetative management to remove heavy fuels, treat disease pockets, and move stand condition toward a more natural composition to improve species diversity and balance vegetative successional stages across the landscape to create stand conditions that meet Forest Plan goals, objectives, and standards by maintaining ecosystem health and productivity.

Fulfilling these goals would contribute to the overall botanical diversity and maintenance of native plant communities and return ecological conditions closer to their natural range. Floral diversity is dependent upon both early and late seral communities in the project area. Seral plant species requiring some form of disturbance would be benefited from satisfying the purpose and need of this project. However, the potential effects of proposed activities to species and habitats may be both detrimental and beneficial. This document provides an analysis of rare species potentially present and the effects proposed activities may have on them. For the purpose of this analysis, rare plant species include endangered, threatened, and sensitive species of concern.

EXISTING CONDITION

The Green Horse project area is dominated by seral species due to past fire exclusion. The area has also been affected by a hemlock looper outbreak that has defoliated many trees. Early seral species such as Ponderosa pine and western larch are present but reduced from historic levels. Overall forests are dense and vegetatively simplified compared to historic conditions. Botanically the lands in the project are also simplified compared to past conditions that were shaped by disturbance to be more diverse and complex. Habitat for late seral species has increased, while species with an affinity for more open conditions have likely declined.

Two species of concern are known to occur in the project area, but potentially suitable habitat for several others is present. Given the extensive area of suitable habitat for some of the species of concern, it is anticipated that additional undocumented populations may occur.

Geographic/Temporal Scope

Analysis Area

Direct and indirect effects were analyzed within the context of the project area, which includes approximately 9,500 acres in the O'Hara Creek, Glover Creek-Selway River, Horse Creek, and Upper American River watersheds.

Cumulative Effects Area

The area of consideration for cumulative effects includes lands within the entire project area. The rationale for this is that the effects are site specific to areas treated within the project area and will not

extend beyond the boundaries, and effects from outside the defined area will likewise not affect the resource within. These effects are considered only for the species potentially affected by this project from the initial habitat transformations in the early 1900s through the proposed and reasonably foreseeable future.

Methodology

Analysis included study of aerial photos and topographic and forest habitat maps to identify potential habitat for plants of concern. Individual species requirements were reviewed, and appropriate modeling criteria selected to determine which species or corresponding habitat would be expected to occur in the project area.

The basic mapping unit used is the Habitat Type Group (HTG). This classification groups similar forest habitats into functional categories based upon vegetative type, moisture and temperature characteristics. For some species, these units are useful to match species criteria to potential habitat. For other species, the Habitat Type Group itself may not be a good indicator of suitable habitat but may provide the microsites the species requires. Other species may have more specific habitat parameters that enable more precise modeling than the HTG.

Using GIS, the habitat units important to sensitive plants were identified and mapped for the project area. Locations of the proposed activities were evaluated against the habitat groupings to determine which activities would occur in those habitats. Each activity occurring in potential habitat was evaluated based on the criteria important for each species. Brief narratives of the criteria used for evaluating each species and its habitat are discussed below.

Based on the results of research and GIS analysis; direct and indirect effects are discussed for each species. Direct effects could result from vegetation management, prescribed burns, and road construction. Indirect effects for some species may include the expansion of weeds and the mitigating treatments of these infestations or changes to the forest canopy that may affect light and temperature regimes. Cumulative effects are the overall effects to species from past, present and reasonably foreseeable future projects. Historically such effects on individual species were not measured or noted. However, the past effects on general habitat condition can be qualified and matched to species dependent on a particular habitat.

The effect on potentially suitable habitat, measured in acres, is the primary indicator used in the analysis.

Federally Listed Species

Current U.S. Fish and Wildlife Service (USFWS) direction indicates two Threatened plant species, Macfarlane's four-o'clock (*Mirabilis macfarlanei*) and Spalding's catchfly (*Silene spaldingii*), are to be addressed for projects occurring in Idaho County. Past assessments and direction provided by the USFWS indicate that habitat for these species is limited to the Salmon River basin on the Nez Perce unit of the Forest. There are no occurrences or suitable habitat for any federally listed or candidate for listing species in the Green Horse project area, which is in the Selway and South Fork Clearwater watersheds.

Sensitive Species

Two sensitive species occur in the project area: Payson's milkvetch (*Astragalus paysonii*) and Evergreen kittentail (*Synthyris platycarpa*); however suitable habitat exists for 12 additional species. Discussions of each species' habitat and potential occurrence follow Table 1, which summarizes potential habitat in the project area. Sensitive species not included in the table are not suspected to occur in the project area, nor is suitable habitat present based upon existing information or habitat modeling. A complete list of the sensitive plant species for the Nez Perce - Clearwater National Forest can be found in the determinations section. The inclusion of Table 3 in the determinations section allows this document to also serve as the rare plant biological evaluation for this project.

Table 1: Potential Sensitive Plants within Project Area

Common and Latin Name	Presence	Habitat/Community Type	Potential Habitat (acres)
Payson's milkvetch <i>Astragalus paysonii</i>	Yes	Openings, gaps, and disturbed areas in mixed conifer forests. Generally, in the warm grand fir series.	2,567
Deerfern <i>Blechnum spicant</i>	Potential	Moist to wet and mid-late seral grand fir, western hemlock, or cedar forests. Often found in riparian areas.	98
Lance-leaf moonwort <i>Botrychium lanceolatum</i> var. <i>lanceolatum</i>	Potential	Shaded, moist sites under various conifers; dry to moist meadows	2,087
Linear-leaf moonwort <i>Botrychium lineare</i>	Potential	Open grasslands, shaded forests, and dry to moist meadows	2,087
Mingan moonwort <i>Botrychium minganense</i>	Potential	Shaded, moist sites under conifers, usually cedar. Occasionally edges of meadows.	2,087
Mountain moonwort <i>Botrychium montanum</i>	Potential	Moist, shaded, late-seral conifer forests - usually cedar. Occasionally on edge of shaded meadows.	2,087
Northern moonwort <i>Botrychium pinnatum</i>	Potential	Shaded, moist sites under various conifers; dry to moist meadows	2,087
Least moonwort <i>Botrychium simplex</i>	Potential	Moist, shaded forest understory, small openings, moist meadows	2,087
Green bug-on-a-stick <i>Buxbaumia viridis</i> (moss)	Potential	Moist grand fir or cedar forests on large decayed logs and ash soils.	7,456
Clustered lady's-slipper <i>Cypripedium fasciculatum</i>	Potential	Partial shade of warm and moist cedar, grand fir or Douglas fir.	2,219
Light hookeria <i>Hookeria lucens</i>	Potential	Wet spots in shaded coniferous forests, generally associated with water.	818
Naked-stem rhizomnium <i>Rhizomnium nudum</i> (moss)	Potential	Moist substrates at low to moderate elevation in cool to warm mesic forests. Often riparian.	3,588
Evergreen kittentail <i>Synthyris platycarpa</i>	Yes	Cool, shaded, moist sites in mid-montane forests at mid elevations	3,581
Idaho barren strawberry <i>Waldsteinia idahoensis</i>	Potential	Cool, moist forest types at moderate elevations	917

Payson's milkvetch (*Astragalus paysonii*): Payson's milkvetch is a narrowly endemic species found only in two disjunct population centers: southwestern Wyoming/adjacent southeastern Idaho and in Idaho County, Idaho. Within Idaho County, populations are generally found in open patches of ground in the early seral phases of warm grand fir habitat groups. The vetch is an early colonizer and appears dependent upon regular disturbance within its habitat for survival; fire suppression has likely reduced suitable habitat

for the species (Lorrain 1990). Habitat is maintained by fire and other stochastic events as well as human-caused disturbance such as timber harvest and road building. There is one known occurrence within the project area.

Deerfern (*Blechnum spicant*): Deerfern occurs primarily west of the Cascade Range, but with several disjunct populations in Northern Idaho. The species is an indicator of moist to wet forest types and can be found in wet pockets throughout these habitat groups. Within our area habitat consists of mid-late seral grand fir, western hemlock, or cedar forests. Though it can be found in some upland areas, highest likelihood habitat is typically found in riparian areas of these forest types. Fire is infrequent in the habitat of deerfern and the species may take decades to recolonize after a major burn event.

Lance-leaf moonwort (*Botrychium lanceolatum* var. *lanceolatum*), Linear-leaf moonwort (*Botrychium lineare*), Mingan moonwort (*Botrychium minganense*), Mountain moonwort (*Botrychium montanum*), Northern moonwort (*Botrychium pinnatum*), Least moonwort (*Botrychium simplex*): Moonwort species are known for their cryptic identification and rarity, thus, little is known about them on the Forest. Throughout the west, general habitat for moonworts varies widely from dry meadows, grass/forb openings, and an array of forest types. In northern Idaho, they are most commonly associated with riparian areas and moist sites under mature western red cedar though they may be present in transitional habitats (Lorrain 1990). All *Botrychium* species are believed to be obligately dependent upon mycorrhizal relationships for nutrients, water, and minerals (Vanderhorst 1997). Variability in habitats and mycorrhizal associations make predictions on suitable habitat extremely difficult. Moonwort species often grow together in similar habitats; therefore, the species are grouped together for analysis.

Green bug-on-a-stick (*Buxbaumia viridis*): This moss is found across the Pacific Northwest and Northern Rockies but is considered uncommon to rare across this range. This rarity could be due to its small size and inconspicuous nature as habitat requirement needs appear easily met in numerous microsites across the Forest. In north-central Idaho it is found in scattered locations on moist sites under mid-to-late seral conifer forests. Substrate availability and shade (humidity levels) are important factors (Laaka 1992), and most occurrences are in a closed canopy forest under large logs in advanced stages of decay. Though the species may occur in numerous microsites with suitable conditions, the majority of desirable habitat is likely to be in forested riparian areas, mesic old growth, and late successional forests that provide necessary downed logs.

Clustered Lady's-Slipper (*Cypripedium fasciculatum*): This orchid is widespread, but rare in the western United States. In north-central Idaho, most occurrences are in warm, moist sites in mid-to-late seral conifer communities of a western red cedar habitat type, though a substantial number of populations are in Douglas-fir and grand fir habitats. Its occurrences may be tied to mycorrhizal fungal relationships that are dependent upon minimal sunlight. No unique habitat parameter is known that enables biologists to better predict future occurrences with more specificity (Greenlee 1997). This means that although there is an apparent abundance of suitable habitat within the project area, much of it may not actually support the species. Clustered lady's slipper does not grow in areas have undergone even-aged management and may take decades to recover from disturbances such as timber harvest and fire (Vance and Lake 2001).

Light hookeria (*Hookeria lucens*): Light hookeria has scattered distributions across the globe, most notably along the North American Pacific Coast. There are disjunct populations associated with the maritime influence in north-central Idaho in several drainages on the Clearwater National Forest. Most occurrences are within moist to wet habitat groups supporting western red cedar, western hemlock, or grand fir. The moss is tightly associated with shaded, moist sites, typically along stream sides.

Naked-stem rhizomnium (*Rhizomnium nudum*): This moss can be found throughout the Pacific Northwest but is considered rare in the Columbia Basin. It grows in boreal and temperate forests on soil, humus, or rotten logs, often along streams or in damp depressions, and occasionally amongst boulders or talus at the bottom of cliff faces (Christy and Wagner 1996) from near sea level to subalpine zones. Most inland populations are riparian, but potential habitat is occasionally found in damp areas above streams.

Evergreen kittentail (*Synthyris platycarpa*): Evergreen kittentail is a narrowly endemic species, limited to suitable habitats within Idaho and Clearwater counties, Idaho. It occupies cool, shaded, moist grand fir and western red cedar forests, at mid-elevations. It rarely occurs in conjunction with lodgepole pine (Crawford 1980). Although it is a shade-tolerant species, evergreen kittentail is tolerant of disturbance and appears to do well with even-aged management and low-moderate fire. There are multiple known occurrences within the project area.

Idaho barren strawberry (*Waldsteinia idahoensis*): Idaho barren strawberry is a narrowly endemic species, only known from a handful of localities in north central Idaho and western Montana. Where populations have established, the plant occupies cool, moist forest types at moderate elevations often along streams up into mid-slopes. The species is shade-tolerant and occasional occurrences are found in mature stands; however, *Waldsteinia idahoensis* appears to respond vigorously to timber harvest and low to moderate burns (Crawford 1980) and populations are larger in more open stands.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

No Action Alternative

Since there are no management activities proposed under this alternative, there would be no direct effects on plant species or habitats. However, changes in stand structure would be expected through time, some of which would alter habitats that are suitable for some sensitive plant species. In some cover types, forest openings may occur as seral species decline. In more mixed-conifer forest types, succession would continue to progress, resulting in a decline in size and frequency of small openings and forest gaps. In general, species requiring later seral forests would see an improvement in habitat quality and species with poor dispersal mechanisms would have an increased opportunity for establishment. Species requiring more open conditions would likely decline barring the absence of significant fire or other forest clearing event such as severe wind or disease. The increased severity of wildfire is possible due to the increased fuel build up in areas of past fire exclusion. Such an event would favor early seral species, while reducing or eliminating habitat for late seral species. More severe fires also pose an increased risk for an aggressive weed response following the event.

Management Activities

The primary management activity that may affect species or habitats of concern in the Green Horse project would be timber harvest, particularly the regeneration harvests which subject the habitat to more mechanical disturbance and alter the light, temperature, and moisture regimes that determine distribution for most plants. Early seral species may benefit from such changes, but later seral species would decline or be extirpated. The implementation of intermediate harvest has some potential for direct mechanical harm during implementation, but generally the overall habitat conditions likely would not change enough to harm most late seral species. Much of the preferred habitats utilized by later seral species are generally associated with riparian areas that are excluded from proposed units or protected by application of PACFISH riparian buffers (see Aquatics report).

Prescribed fire and fire associated with site preparation post-harvest is generally implemented under moderated conditions that allow fuels to be treated without displacing large areas of forests. While direct effects to plants on the ground can occur at implementation, the overall habitat through time is not substantially changed. However, some localized areas may burn severely and result in ecological changes. In the riparian areas of the moister forest types it is less likely that fire would carry with enough severity to appreciably alter habitat; however, there is some potential for this. Species requiring more open habitats could benefit from fire that reduces conifer or brush encroachment; however, invasive weeds could increase in such areas as a response to the disturbance. Habitats for sensitive plant species will undergo a mix of beneficial to detrimental effects depending upon the severity and placement of fire and the individual species ecology. With these treatments, plants may be harmed upon implementation but the stand ecology determining plant distribution would not change appreciably overall.

Reconstruction of existing roads are viewed as maintaining current conditions from the perspective of suitable habitat for rare and sensitive plants as these old roads generally do not provide any potential habitat for species of concern. Where these routes cross streams or low moist areas, there is the possibility of mechanical damage or negative effects to occurrences or suitable habitat within the vicinity of the road. However, these impacts would be anticipated to be negligible and rare because work would be almost entirely limited to the road crossing itself with limited impact to adjacent ground. roads are also a direct disturbance to suitable habitats. Temporary road segments were sorted by potential habitats for sensitive plant species, and it is assumed that for each mile of road constructed approximately 2.5 acres of habitat would be reduced over the short term. Recovery of such sites could be relatively rapid for early seral species that may quickly colonize disturbed ground, but for late seral species many decades may pass before habitat is again suitable.

Action Alternative

The effects analysis is based on evaluation of the above proposed management activities occurring in potentially suitable habitat and the potential for those activities to directly or indirectly effect plant populations or habitat characteristics. Effects on sensitive plant species by management activities of this project are summarized in Table 2. Acres are rounded to the nearest whole number. Specific discussion of effects of planned management activities to each sensitive species with potential habitat in the project area follows the table.

Table 2: Potential Sensitive Plant Habitat Affected by Action Alternative (acres)

Species	Activity	Action Alternative
*Payson's milkvetch <i>Astragalus paysonii</i>	Regeneration	442
	Intermediate	91
	Prescribed Burn	290
	Temporary roads	2
Deerfern <i>Blechnum spicant</i>	Regeneration	54
	Intermediate	0
	Prescribed Burn	0
	Temporary roads	0
Moonworts <i>Botrychium</i> spp.	Regeneration	274
	Intermediate	29
	Prescribed Burn	47

Species	Activity	Action Alternative
	Temporary roads	2
Green bug-on-a-stick <i>Buxbaumia viridis</i> (moss)	Regeneration	1,108
	Intermediate	112
	Prescribed Burn	286
	Temporary roads	3
Clustered lady's-slipper <i>Cypripedium fasciculatum</i>	Regeneration	421
	Intermediate	30
	Prescribed Burn	27
	Temporary roads	1
Light hookeria <i>Hookeria lucens</i>	Regeneration	54
	Intermediate	0
	Prescribed Burn	0
	Temporary roads	0
Naked-stem rhizomnium <i>Rhizomnium nudum</i> (moss)	Regeneration	294
	Intermediate	6
	Prescribed Burn	0
	Temporary roads	0
Evergreen kittentail <i>Synthyris platycarpa</i>	Regeneration	721
	Intermediate	104
	Prescribed Burn	559
	Temporary roads	4
Idaho barren strawberry <i>Waldsteinia idahoensis</i>	Regeneration	5
	Intermediate	1
	Prescribed Burn	0
	Temporary roads	0

*Known occurrences exist within project area

***Payson's milkvetch (*Astragalus paysonii*):** Proposed management activities would occur on approximately one third of the modeled habitat for Payson's milkvetch. This species appears highly adapted to disturbance and natural forest succession is likely the largest threat to its long-term survival (Lorrain 1990). Other long-term threats include infestations of exotic or noxious weeds and noxious weed herbicide treatments which could increase resource competition and eliminate or change habitat conditions (Heidel 2013). Temporary road decommissioning could also harm the species long-term, but the disturbance will likely benefit the plants in the short-term. Mechanical impacts on individuals from timber harvest, prescribed burns, and temporary roads are possible, but Payson's milkvetch populations are likely to benefit from the disturbance overall as it would increase habitat.

Deerfern (*Blechnum spicant*): Potential habitat for deerfern exists in 98 acres of the project area and of this, management activities are proposed to take place in 54 acres. Activities such as timber harvest that revert forests back to early successional stages would reduce potential habitat for deerfern. Generally, deerfern has an affinity for riparian areas and the better quality habitats that are most likely to support populations occurrences are protected by PACFISH stream buffer requirements (see Aquatics report).

Lance-leaf moonwort (*Botrychium lanceolatum* var. *lanceolatum*), Linear-leaf moonwort (*Botrychium lineare*), Mingan moonwort (*Botrychium minganense*), Mountain moonwort (*Botrychium montanum*), Northern moonwort (*Botrychium pinnatum*), Least moonwort (*Botrychium simplex*): Threats to *Botrychium* species are not well understood. The only well-documented threat resulting in population decline was drought combined with fire (Johnson-Groh and Farrar 1996). However, it is thought that activities that disturb soil and sever the mycorrhizal relationship are detrimental. Timber harvest generally severs this tie and increases light and temperature regimes at ground level, which could also be damaging. Contrarily, some species have been known to occur in transitional and edge habitats in other parts of their distribution (Chadde and Kudray 2001) thus certain types of activities may benefit populations. This has been particularly noted with northern moonwort, least moonwort and less often Mingan moonwort. The latter situation has not been noted on the Nez Perce Clearwater as Mingan moonwort appears to have a very high affinity only for western redcedar groves. All species have been linked to moist microsites on the Forest, therefore buffering riparian areas and meadows is likely to protect many areas where moonworts are most likely to occur.

Green bug-on-a-stick (*Buxbaumia viridis*): Potential habitat for green bug-on-a-stick occurs throughout the project area. Proposed management actions would take place on approximately 1,509 acres of potential habitat. Regeneration timber harvest and fuels management activities will likely alter the temperature, light, and moisture regimes necessary to support green bug-on-a-stick within its micro-habitats in harvested areas. Intermediate harvests may not substantially alter stand structure, but it could impact downed log recruitment which is a necessary component of green-bug-on-a-stick habitat. Thus, extirpation would be expected if occurrences exist. However, most occurrences and well-developed habitat for this species are likely to occur in moist riparian areas that are buffered out of the harvest area which have the greatest potential for maintaining large decaying logs within grand fir habitat. These areas are protected from the adverse effects of timber harvest and unlikely to be heavily impacted by either temporary roads or fire.

Clustered Lady's-Slipper (*Cypripedium fasciculatum*): Proposed management activities would occur on 479 acres of potential habitat for *Cypripedium*. The species is highly sensitive to disturbance and canopy removal from activities such as regeneration timber harvest, temporary road construction, and fire, which alter moisture, temperature, and light regimes and may sever essential relationships with mycorrhizal fungi. Removal of the duff layer to expose soil may also have detrimental effects. Monitoring indicates that plants growing in full sunlight after harvest had yellowed and deformed leaves. Given this, it would be expected that any potential populations within these management units would be extirpated.

Generally, intermediate harvests could maintain enough canopy and duff cover to sustain suitable habitat (Lichthardt 2003), but individuals may be damaged or removed by harvest activities such as skidding logs. There is some evidence to suggest that suitable habitat may survive low intensity underburns as well (Hays 1995). However, relationships with fire are complex as an early spring fire with heavy fuel loads on moist soils could conduct too much heat into the ground while the faster, hot fall burns may avoid this, but may damage individuals above ground.

Light hookeria (*Hookeria lucens*): Proposed management activities are planned in 54 acres of potential habitat within the project area. Light hookeria is sensitive to changes in light, temperature, and moisture regimes that would result from canopy removal, thus would be extirpated in areas where timber harvest and fuels treatments occurred. Highest quality habitat for this species is typically limited to riparian habitats and is not likely to be significantly impacted by management activities associated with this project due to PACFISH riparian buffer requirements (see Aquatics report).

Naked-stem rhizomnium (*Rhizomnium nudum*): Potential habitat for rhizomnium exists in 3,588 acres of the project area, only 300 of which is within proposed treatment areas. The majority of highly

suitable habitat is likely within the immediate vicinity of riparian zones and, thus, is protected by PACFISH buffers (see Aquatics report). However, naked-stem rhizomnium may also occur in damp draws farther up away from riparian areas. The species is sensitive to disturbance that would cause large openings leading to changes in light, temperature, or moisture regimes and would likely be impacted if populations existed within the project area.

***Evergreen kittentail (*Synthyris platycarpa*):** Suitable habitat for evergreen kittentail exists within 3,581 acres of the project area. Approximately 1,388 of these acres are within proposed treatment areas. Although mechanical damage to individuals may occur during management activities, past observations suggest that the species may respond well to disturbances such as timber harvest and light-moderate burns (Crawford 1980), especially along edges of cuts in partially shaded areas.

Idaho barren strawberry (*Waldsteinia idahoensis*): The broad Elk City area is one of two major hubs of documented occurrences for Idaho barren strawberry. Suitable habitat exists within 917 acres of the Green Horse project area, though only 6 of these acres have proposed management activity. Mechanical damage to individuals may occur during management activities such as timber harvest, fuels treatments, and road work. However, monitoring suggests populations may increase in harvested and lightly-moderately burned areas (Crawford 1980).

Effects Determinations

Determination of effects on rare plant species by management activities of this project are summarized in the table below. This table includes all plant species on the Nez Perce - Clearwater National Forest sensitive list as well as plants federally listed under the ESA, which allows this document to serve as both the biological evaluation and biological assessment for this project. There is some potential for impacts to several species as indicated based upon habitat presence and occurrence. Treatments over the large portion of the habitat would not change the local environment enough to significantly harm these species should they be present. Any of these species if present may be impacted by the proposed management activities, but due to low percentage of habitat undergoing potentially harmful treatments there would be no concerns for the overall species viability.

Table 3: Summary of Effects for Threatened and Sensitive Plant Species

Plant Species	Known Occurrence	Potential Habitat Present	Effects Determination	
			No Action	Action Alternative
Water howellia <i>Howellia aquatilis</i>	No	No	NE	NE
Macfarlane's four-o'clock <i>Mirabilis macfarlanei</i>	No	No	NE	NE
Spalding's catchfly <i>Silene spaldingii</i>	No	No	NE	NE
Maidenhair spleenwort <i>Asplenium trichomanes</i>	No	No	NI	NI
Payson's milkvetch <i>Astragalus paysonii</i>	Yes	Yes	NI	BI/MI
Deerfern <i>Blechnum spicant</i>	No	Yes	NI	MI
Crenulate moonwort <i>Botrychium crenulatum</i>	No	No	NI	NI
Lance-leaf moonwort <i>Botrychium lanceolatum</i> var. <i>lanceolatum</i>	No	Yes	NI	MI

Plant Species	Known Occurrence	Potential Habitat	Effects Determination	
Linear-leaf moonwort <i>Botrychium lineare</i>	No	Yes	NI	MI
Mingan moonwort <i>Botrychium minganense</i>	No	Yes	NI	MI
Mountain moonwort <i>Botrychium montanum</i>	No	Yes	NI	MI
Northern moonwort <i>Botrychium pinnatum</i>	No	Yes	NI	MI
Least moonwort <i>Botrychium simplex</i>	No	Yes	NI	MI
Leafless bug-on-a stick <i>Buxbaumia aphylla</i> (moss)	No	No	NI	NI
Green bug-on-a-stick <i>Buxbaumia viridis</i> (moss)	No	Yes	NI	MI
Broadfruit mariposa <i>Calochortus nitidus</i>	No	No	NI	NI
Constance's bittercress <i>Cardamine constancei</i>	No	No	NI	NI
Buxbaum's sedge <i>Carex buxbaumii</i>	No	No	NI	NI
Bristle-stalked sedge <i>Carex leptalea</i>	No	No	NI	NI
Many headed sedge <i>Carex sychnocephala</i>	No	No	NI	NI
Anderegg's cladonia <i>Cladonia andereggii</i>	No	No	NI	NI
Pacific dogwood <i>Cornus nuttallii</i>	No	No	NI	NI
Clustered ladyslipper <i>Cypripedium fasciculatum</i>	No	Yes	NI	MI
Dasynotus <i>Dasynotus daubenmirei</i>	No	No	NI	NI
Idaho douglasia <i>Douglasia idahoensis</i>	No	No	NI	NI
Giant helleborine <i>Epipactis gigantea</i>	No	No	NI	NI
Puzzling halimolobos <i>Halimolobos perplexa</i> var. <i>perplexa</i>	No	No	NI	NI
Sticky goldenweed <i>Haplopappus hirtus</i> var. <i>sonchifolius</i>	No	No	NI	NI
Light hookeria <i>Hookeria lucens</i>	No	Yes	NI	MI
Salmon-flowered desert-parsley <i>Lomatium salmoniflorum</i>	No	No	NI	NI
Chickweed monkeyflower <i>Mimulus alsinoides</i>	No	No	NI	NI
Spacious monkeyflower <i>Mimulus ampliatus</i>	No	No	NI	NI
Thin sepal monkeyflower <i>Mimulus hymenophyllus</i>	No	No	NI	NI
Gold-back fern <i>Pentagramma triangularis</i> spp. <i>triangularis</i>	No	No	NI	NI
Sweet coltsfoot <i>Petasites frigidus</i> var. <i>palmatus</i>	No	No	NI	NI
Whitebark pine <i>Pinus albicaulis</i>	No	No	NI	NI
Licorice fern	No	No	NI	NI

Plant Species	Known Occurrence	Potential Habitat	Effects Determination	
<i>Polypodium glycyrrhiza</i>				
Naked-stem rhizomnium <i>Rhizomnium nudum</i> (moss)	No	Yes	NI	MI
Mendocino sphagnum <i>Sphagnum mendocinum</i> (moss)	No	No	NI	NI
Evergreen kittentail <i>Synthyris platycarpa</i>	Yes	Yes	NI	BI/MI
Sierra wood-fern <i>Thelypteris nevadensis</i>	No	No	NI	NI
Short style toefieldia <i>Triantha occidentalis</i> ssp. <i>brevistyla</i>	No	No	NI	NI
Douglas clover <i>Trifolium douglasii</i>	No	No	NI	NI
Plumed clover <i>Trifolium plumosum</i> var. <i>amplifolium</i>	No	No	NI	NI
Idaho barren strawberry <i>Waldsteinia idahoensis</i>	No	Yes	NI	BI/MI

Threatened Species Determination: NE = No Effect; NLAA = Not Likely to Adversely Affect; LAA = Likely to Adversely Affect.

Sensitive Species Determination: NI = No Impact; BI = Beneficial Impact; MI = May impact individuals or habitat but not likely to cause trend toward federal listing or reduce viability for the population or species; LI = Likely to impact individuals or habitat with the consequence that the action may contribute towards federal listing or result in reduced viability for the population or species.

Cumulative Effects

Discussion of cumulative effects for rare plants is addressed through the general trend of the suitable habitat required by these species as a result of past, present and future management actions. It generally is not possible to directly quantify effects of specific activities that are several years or decades old on species of concern today. The status and occurrence of rare plants was completely unknown for much of the management history of the watershed. Historically the changes in condition and abundance of specific habitats important to these species are also largely unknown. Therefore, the effects of these past projects can only be qualified through general discussions. However, the results of past projects contribute to the current condition, which can be used to discuss and quantify effects of proposed activities on rare plant species.

Past, Present, and Foreseeable Future Actions

The primary management activities that have influenced rare plant habitat in the Green Horse area and continue to under this project include past and present timber harvest, fire, and road construction. Timber harvest started in the area in the 1970s when 74 acres were harvested. Harvest increased substantially in the following decades with 796 acres harvested in the 1980s and 541 acres harvested in the 1990s. Approximately 24 acres were harvested in the 2000s. Harvest has not occurred since that time. Thus, overall trends of harvest impact have been downward with a corresponding decline in effects to plant habitat. In addition, advancement in harvest operations and logging technology would further reduce resource impacts.

Road construction activity generally mirrors harvest activity as the roads were primarily constructed to provide access to timber. Approximately 20 miles of the road work in the project area is expected to consist of routine maintenance and repairs. Of this, 19 miles may need some level of reconstruction. Additionally, short segments of new temporary roads associated with the project will occur. As shown in Table 2, the addition of new temporary roads will have minimal effects to rare plants. Overall the trend of road related impacts to rare plants continues to decline.

Wildfire has occurred irregularly as far back as records have been kept and has been a major determinant in the abundance and suitability of habitat for some sensitive plant species. It is known that approximately 2,988 acres within the project area burned prior to 1920. With suppression activities wildfire has been light (60 acres) from the 1920s to the large fires of 2015 but changes in wildfire management and fuel build up after decades of suppression contribute to increased fire likelihood into the future. In 2015 approximately 1,062 acres within the project area burned. 29 additional acres have burned since that time. Due to fire suppression, the general habitat trend for late successional plant species would have increased due to succession in unburned areas, but anticipated trends may contribute to some reduction in later seral vegetation. Timber harvests beginning in the 1970s would have offset this loss of succession hindering disturbance, but only to a relatively small degree. Habitat for rare plant species continues to expand or retract depending upon individual species preference for open or closed habitats.

Ongoing and foreseeable actions within the proposed activity areas consist of recreation, grazing, fire suppression and weed treatments. Motorized recreation and dispersed-camping activities may increase in the future, but the effects would be largely limited to designated existing routes and dispersed-camping areas. This would result in fewer acres affected by these activities overall with a reduction in impacts to rare plant species. Maintenance of these travel routes is considered routine and ongoing, with virtually no effects to the habitat which they pass through.

The project lies within the American River grazing allotment. Grazing would continue to potentially impact vegetation in some harvest areas; however, due to terrain most effects would be along roadways. Grazing impacts would likely increase during a time period of up to 20 years after harvest when more forage is available in the harvest units. Ongoing allotment management activities are designed to continue to improve trends in rangeland health, vegetation, watershed conditions, and in ecological sustainability relative to livestock grazing. In addition, the improved forage in harvest areas will serve to draw livestock away from some of the more sensitive areas where rare species and suitable habitat are found.

Fires suppression activities would be anticipated, but the occurrence, extent, and/ or intensity of suppression efforts cannot be estimated or predicted. In addition, noxious weed treatments may occur periodically in the project area. These are spot applications not expected to affect any species of concern because rare species generally do not grow in treatment areas and because non-target species are avoided by spray crews. These activities are considered ongoing and routine with virtually no effects to the habitats of concern or rare species.

No Action

The no action alternative would produce no additional effects on potential rare plant habitat, as compared to past activity levels. The progression of forest succession would improve habitat for most sensitive plant species. However, the decline of successional tree species due to competition, disease or insect-caused mortality may cause localized openings and increases in light and fuel loads, which could lead to more intense wildfires and resource damage. In such cases, older habitat favored by these plant species could see localized declines, but the trend overall would be one of increasing habitat suitability. Conversely, species favored by more open conditions would decline as general forest succession progressed absent of large-scale disturbance such as wildfire.

Proposed Action

This alternative adds short-term disturbance to this landscape through timber harvest, prescribed burning, and temporary road construction. These activities would result in a localized decline in potentially suitable sensitive plant habitat for species requiring late successional habitat. Such a downward trend in habitat quality would not lead to concerns for overall population viability, since these habitats are common in other parts of the project area. Recovery of suitable habitat in the treatment areas could vary from a few years to several decades depending upon the species. In the project area as a whole, the overall

trends in habitat for these species would be increasing with the overall advancement of succession. Sensitive species requiring open habitats would see some localized improvements in some treatment areas. This is especially true where habitats are naturally open, or trees might be encroaching onto grasslands. However, the effects through time on this habitat would be mixed as existing individual plants could be damaged if present. The site prep burn activity would also contribute to maintenance of such habitat; however, these disturbances could increase weed infestations in the area.

REGULATORY FRAMEWORK

Threatened and endangered species are designated under the Endangered Species Act. It is the policy of Congress that all Federal departments shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of this purpose (ESA 1531.2b). Three plants listed as Threatened in the context of the Nez Perce – Clearwater National Forest and are addressed under the ESA. The Threatened plants are Macfarlane’s four-o’clock (*Mirabilis macfarlanei*), water howellia (*Howellia aquatilis*) and Spalding’s catchfly (*Silene spaldingii*).

Sensitive species are defined in the Forest Service Manual (FSM 2670.5) as “those plant and animal species identified by the Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers, density, or habitat capability that reduce a species/existing distribution.” In FSM 2670.22, management direction for sensitive species is in part, to ensure that species do not become threatened or endangered, because of Forest Service actions and to maintain viable populations of all native species. The most recent update to the sensitive species list became effective in May 2011 (USDA-FS 2011). The Forest Service must evaluate impacts to sensitive species through a biological evaluation.

This specialist report contains the necessary determinations section and discussion of effects for sensitive plant species to serve as the Biological Evaluation for rare plants as directed by the streamlined BE processes outlined in the FSM. This report also discloses and documents the effects to the threatened plant species that potentially occur on the Nez Perce National Forest; thus, this report also serves as the Biological Assessment for this project.

FOREST PLAN CONSISTENCY

The forest plan states that no action will be taken that will jeopardize a threatened and/or endangered species. As stated under the regulatory framework, the objective for managing sensitive species is to ensure population viability throughout their range on National Forest lands and to ensure they do not become federally listed as threatened or endangered. The forest plan supports this direction but does not set specific standards and guides for sensitive plants. The proposed actions are consistent with this direction to the extent that proposed management actions would not adversely affect viability of existing sensitive plant populations or habitat.

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